CLAIMS

1. An enclosure comprising a housing and interconnection backplane for the mounting and interconnection of a plurality of card-shaped processing modules and at least one interface module, the interface module being arranged to provide a plurality of external connectors and to transport signals via the backplane between each external connection and an individual processing module, wherein:

- said backplane provides locations for said processing modules to lie across a major portion of the backplane area facing a front side of the enclosure;
- said backplane provides a location for said interface module over a minor portion of the backplane area facing a rear side of the enclosure, so as to provide said external connectors at the rear of the enclosure; and
- a power supply module for powering the modules within the enclosure is positioned over another portion of the backplane area, on the same side as the interface module.

2. An enclosure as claimed in claim 1, constructed so that in use said processor modules lie generally horizontally.

3. An enclosure as claimed in claim 2, wherein air paths are defined through the enclosure so as to pass from end to end thereof, along and between the processor modules.

4. An enclosure as claimed in claim 1, adapted for use in a telecommunications network probe application, wherein in use the transport of signals in the backplane is generally inward, from the external connectors to the processing modules.

5. An enclosure as claimed in claim 1, wherein said external connectors are provided by the interface module for broadband telecommunications signals, and wherein high bandwidth interconnections are provided in the backplane.

6. An enclosure as claimed in claim 5, wherein said interface module provides optical to electrical conversion of said signals, the transport of signals via the backplane being otherwise in essentially the same format as in the external connectors.

7. An enclosure as claimed in claim 1, wherein there is further provided a location for at least one switching module, whereby routing of signals between the external connectors and individual processing modules can be varied.

8. An enclosure as claimed in claim 7, wherein said switching module is operable to route signals between one of said external connectors and a plurality of processing modules.

9. An enclosure as claimed in claim 7, wherein said switching module and interface module provide for re-routing one of said signals from an external input connector to an additional output connector to allow processing in another enclosure.

10. An enclosure as claimed in claim 1, wherein the number of external input connectors exceeds the capacity of processing modules that can be accommodated by said backplane.

11. An enclosure as claimed in claim 1, wherein the processing modules locations on the backplane are sub divided into groups, each group for receiving a set of separately pluggable modules which together co-operate for processing of a given external signal.

12. An enclosure as claimed in claim 11, wherein the backplane provides a plurality of independent buses, each for communication between the modules of one group.

13. An enclosure as claimed in claim 11, wherein the backplane is adapted such that said groups may each include a first processor module having specific capability for a type of external signal to be processed, and a second processor module of generic type for receiving partially processed data from the first processor module, and for further processing and reducing said data for onward communication.

14. An enclosure as claimed in claim 1, wherein a further interface module is provided at the rear side of the backplane, for communication for control and

management purposes via external output connectors for connection to a computer Local Area Network (LAN).

15. An enclosure as claimed in claim 1, wherein the backplane provides a dedicated location for a management module for selective routing of computer Local Area Network (LAN) or other communications from the external connectors to the processing modules.

16. An enclosure as claimed in claim 15, wherein LAN connections in the backplane are unique to each processing module or group of processing modules.

17. An enclosure as claimed in claim 1, wherein said backplane further provides a communication bus connecting all modules, for management functions including power and cooling management.

18. An enclosure as claimed in claim 1, wherein said backplane provides:

- a plurality of pairs of processing module locations, each pair comprising adjacent first and second processing module locations;
- a plurality of independent communication buses each extending between the first processing module location and second processing module location of a respective one of said pairs;
- a plurality of independent interconnections each for bringing a different external input signal from said interface module to a respective one of said first processing module location;
- one or a plurality of independent interconnections for bringing communication signals from said second processing module locations to a second interface module.

19. A rack-mountable enclosure comprising a housing, a power supply module, a fan assembly and an interconnection backplane for the mounting and interconnection of a plurality of card-shaped processing modules, wherein the processing modules in use are arranged to lie generally horizontally in front of the backplane and generally parallel with one another, the power supply module is located behind the backplane, and the fan assembly is located to left or right of the processing modules (in use, as viewed from the front) so as to provide a generally horizontal airflow between them.

20. An enclosure as claimed in claim 19, wherein a location or locations are provided for a shared interface module or modules for providing external connections to the backplane and hence to all of the processing modules, said locations providing for the shared interface module(s) to be located behind the backplane.

21. A multi-processor equipment enclosure comprising a housing and a backplane providing locations for a plurality of processing modules, the backplane further providing a plurality of locations for a configuration module corresponding to respective processing module locations, each configuration module adapting the routing of communication and management signals via the backplane, in accordance with the vendor-specific implementation of the processing module.

22. An enclosure as claimed in claim 21, wherein a communication and management module is provided at a specific location, and configuration module locations are provided on said management module.

23. A multi-processor equipment enclosure comprising a housing and a backplane providing an interconnect for a plurality of processing modules and a management module, the backplane interconnect including generic portions standardised over a range of processing modules and other portions specific to different processing modules within said range, wherein said management module is arranged to sense automatically the specific type of processing module using protocols implemented by the modules via connections in the generic portion of the interconnect, and to route communication and management signals via the backplane, in accordance with the specific implementation of each processing module.

24. An enclosure as claimed in claim 23, wherein said type sensing protocols are implemented via geographic address lines in the standardised portions of a compact PCI backplane.

25. A computer equipment chassis comprising a housing and a backplane providing locations for at least four independent processing sub-systems, each processing sub-

system comprising first and second processing modules separately mounted on the backplane at adjacent locations, wherein the backplane provides at least four independent CPU-peripheral interfaces, each extending only between the adjacent locations of said first and second processing modules, the first processing module operating as a peripheral and the second processing module operating as host.

26. A chassis as claimed in claim 25, wherein the housing and backplane further provide a location for a muli-channel interface module providing external connections for all of the processing sub-systems, the backplane routing signals from the interface module to the appropriate sub-systems.

27. A chassis as claimed in claim 26, wherein said enclosure and backplane further provide a location for a switching module, such that each external connection can be routed and re-routed to different processing sub-systems.

28. A chassis as claimed in claimed 25, wherein the backplane further provides interconnections between the channel processors for communication externally of the enclosure.

29. A chassis as claimed in claim 28, wherein said enclosure and backplane further provide a management module location for routing of said communication from the channel processors to external connectors.

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30. A multi-channel network monitoring apparatus for the monitoring of traffic in a broadband telecommunications network, the apparatus comprising:

- a plurality of external input connectors for receipt of network signals to be monitored;
- a plurality of channel processors mounted within a chassis, each for receiving and processing a respective incoming signal to produce monitoring results for onward communication, the incoming network signals individually or in groups forming channels for the purposes of the monitoring apparatus, each channel processor being arranged to operate independently of the others and being replaceable without interrupting their operation;

- one or more external communication connectors for onward communication of said monitoring results from the channel processors; and
- a switching unit;

wherein the external input connectors are connected to the channel processors via said switching unit, the switching unit in use routing each incoming signal to a selected channel processor and being operable to re-route an incoming channel to another selected channel processor in the event of processor outage.

31. An apparatus as claimed in claim 30, wherein the switching unit is further operable to connect the same incoming channel simultaneously to more than one channel processor.

32. An apparatus as claimed in claim 30, wherein the channel processors are in the form of modules mounted and interconnected on a common backplane.

33. An apparatus as claimed in claim 32, wherein said switching unit comprises a further module mounted on said backplane.

34. An apparatus as claimed in claim 32, wherein said external input connectors are provided by a common interface module.

35. An apparatus as claimed in claim 32, wherein said external communication connectors are connected to the channel processors via a communication management module and via the backplane.

36. An apparatus as claimed in claim 35, wherein said external connectors and communication management module provide for said onward communication to be implemented over plural independent networks for redundancy.

37. An apparatus as claimed in claim 35, wherein the backplane provides an independent connection between each respective channel processor and the communication management module.

38. An apparatus as claimed in claim 35, wherein the channel processors each comprise a self-contained sub-system of host of peripheral processing modules interconnected via a CPU-peripheral interface in the backplane, the backplane, providing a separate peripheral interface for each channel processor.

39. An apparatus as claimed in claim 38, wherein said CPU-peripheral interface for each channel processor includes a compact PCI interface.

40. An apparatus as claimed in claim 32, wherein said backplane and card-like modules are provided in a single rack-mount chassis, which further houses a power supply and cooling fan.

41. An apparatus as claimed in claim 30, wherein the switching unit further provides for routing any of the incoming channels to a further external connector, for processing by a channel processor, external of the chassis.

42. A network monitoring system wherein a first group of multi-channel network monitoring apparatuses according to claim 30 are connected to receive a plurality of incoming signals, wherein the switching unit of each apparatus in the first group provides for routing any of its incoming channels to a further external connector, the system further comprising at least one further multi-channel network monitoring apparatus according to claim 30, connected to receive incoming channels from said further external connectors of the first group of apparatuses, the further apparatus thereby providing back-up in the event of a channel processor failure or replacement within the first group of apparatuses.

43. A network monitoring system wherein a plurality of multi-channel network monitoring apparatuses as claimed in claim 30 are connected to a larger plurality of incoming channels via multiplexing means, the total number of channel processors within the monitoring apparatuses being greater than the number of incoming channels at any given time, such that any incoming channel can be routed by the multiplexing means and appropriate switching unit to an idle channel processor of one of the monitoring apparatuses.

44. A system as claimed in claim 43, wherein the number of channel processors is greater than the number of incoming channels, by at least the number of channel processors in each monitoring apparatus.

45. A system as claimed in claim 43, wherein said multiplexing means includes electronic switches, while inputs and outputs are converted to and from optical form for interconnection between separate enclosures.

46. A system as claimed in any of claims 43, further comprising one or more multi-channel optical power splitters, for tapping into active optical communicationis bearers to obtain the said incoming signals for the monitoring apparatuses.

47. A multi-channel replicating device for broadband optical signals, the device comprising one or more modules having:

- a first plurality of input connectors for receiving broadband optical signals;
- a larger plurality of output connectors for broadband optical signals;
- means for replicating each received broadband optical signal to a plurality of said output connectors without digital processing.

48. A device as claimed in claim 47, wherein said replicating means includes components for optical to electrical conversion and back to optical again.

49. A device as claimed in claim 47, further comprising one or more additional optical outputs and a selector device for selecting which of the inputs signals is replicated at said additional output.

50. A telecommunications network monitoring system comprising:

- an optical splitting device, providing a tap signal for monitoring signals carried by a bearer in a broadband telecommunications network;
- a plurality of network monitoring units, each for receiving and analysing signals from a broadband optical bearer; and

- a signal replicating device according to the fifth aspect of the invention as set forth above, the signal replicating device being connected so as to receive said optical tap signal, and to provide replicas of said optical tap signal to inputs of two or more of said network monitoring units.